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Dan Cardozo
Adams, Broadwell, Joseph and Cardozo
651 Gateway Boulevard, Suite 900
South San Francisco, CA 94080

Re: Information on environmental effects of PEX use for potable water.

Dear Mr. Cardozo:

The State of California is considering adopting a portion of the Uniform Plumbing Code (UPC) which would allow the use of plastic pipe manufactured from cross linked polyethylene (PEX) for potable water use inside dwellings. I conveyed a summary analysis of the potential environmental effects of this action in my July 23, 2001 letter.

I concluded that the installation and use of PEX could result in direct and indirect impacts on the physical environment. If approved, PEX plastic pipe could be installed in thousands of homes in California and because of the potential scope of usage of PEX, these impacts may be cumulatively considerable.

For these reasons, the Department of Housing and Community Development (HCD) needs to comply with the California Environmental Quality Act (CEQA) so that it is adequately informed about the environmental consequences of the proposed approval of PEX.

I have reviewed the State's file on this material which includes material submitted after my July 23, 2001 letter. I find nothing of substance in this new material that changes my opinion that the consumer in California would benefit from an objective, public review, as would be afforded by HCD compliance with the CEQA process.

I identified several issues where HCD needs to resolve potential environmental effects of PEX adoption.

PEX Composition.

Different manufacturing processes produce slightly different products with different chemical and mechanical characteristics. The manufacturer pushing for approval represents only one of the three manufacturing methods and has supplied information of limited scope. For HCD to adequately consider the environmental impact of the code adoption, HCD needs to define the "project" under CEQA completely and obtain information about all three commercial forms of PEX.

Oxidant degradation of polyolefins from high levels of residual chlorine in the potable water supply can cause mechanical failure. Depending on the aggressiveness of oxidizer exposure and environmental conditions, the antioxidant additive in the pipe resin may be consumed rapidly leading to rapid resin degradation. This is a major factor in the failure of polybutylene (PB) pipe. Although industry proponents seek to distance themselves from PB, it is valid for the State to ask for disclosure of the antioxidant additives that are included in the PEX pipe resin to resist degradation. Are these the same as were used for PB?

Mechanical Stability

PEX supporters claim a long history of successful PEX use – this is the same story given by Shell Chemical which touted a PB lifetime of 50 years or more. Nonetheless, in expanded use, some PB installations failed in 5 to 15 years with devastating results for the consumer. The PEX proponents have not submitted information to show why this would not happen again.

Merely citing PEX popularity as does John Messick (November 27, 2001) does not provide objective information. Mr. Messick believes that problems with PB should not be applied to PEX, but the oxidation problem for polyolefins is not changed by crosslinking alone. Merely saying that "problems with PB are well known" ignores the fact that past popularity of PB Shell Chemical to a nearly $1 billion product liability settlement.

Robert Friedlander, PPFA (November 29, 2001) and Rich Houle, Wirsbro (November 28, 2001) cite the new ASTM Test Method F2023-00 "Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water". This method helps address the potential problem, but it is important for HCD to be able to independently review the results of the testing and understand why the test method applied to PEX differentiates from the similar methods applied to PB. Relevant standards are good; their existence is not a substitute for the judgement of the state.

Public Health

Industry has not yet dealt directly with the issue of public health. We raised the issues of chemical leaching and permeation from environmental contaminants. These are complex problems to assess and must begin with a complete disclosure of the composition of all forms of PEX which may be used in California. Chemical leaching would also need to take into account breakdown products from antioxidants and other substances that may be formed in the pipe by reaction with chlorine in the water supply.

The potential for leaching is not unique to chlorinated resins or solvent welded pipe systems. It can only be addressed by disclosure.

PEX plastic pipe manufacturers have not disclosed the necessary information to the state. Instead, manufacturers rely on NSF International, a private code organization, and ANSI/NSF Standard 61 certification of plumbing materials for health effects in drinking water. I do not seek to impugn NSF's credibility. NSF and ASTM have adopted or modified test methods in response to issues we have raised over many years. NSF certification, however, does not fulfill HCD's requirements for disclosure under CEQA.

The issue of the state of California relying on NSF has arisen in the past in the debate over the use of plastic pipe in California. NSF performs a valuable role, but the state of California cannot delegate to NSF its own obligation for public health and environmental protection. The state of California needs to exercise its independent judgment in the course of CEQA compliance.

NSF does not normally disclose the results of testing, therefore we have no idea of what compounds have actually been detected by NSF tests for chemical leaching from PEX. The material-specific analyses required give an indication of the kind of information which HCD should seek in order to define the potential public health impact of adopting PEX in California.

The letter from John Messick (November 27, 2001) is an example of careless argumentation as a substitute for real information. Mr. Messick notes that he did not see my original letter which reflects information available in mid 2001. He mistakenly claims that "PEX is nothing more than polyethylene (PE) that has been reinforced by crosslinking the molecules". Clearly, for PEX to serve as a pipe resin it must have additives. Industry should disclose these.

The Plastic Pipe and Fittings Association (Richard Church, November 28, 2001 and Robert Friedlander, November 29, 2001) cites NSF, but does not offer California the actual information. NSF can disclose its results if the individual manufacturers agree. If the standard evaluates all extractants, what results have been obtained? As pointed out in past comments, NSF will pass materials found to have extractants for which no explicit allowable level has been set. The State should determine what these extractants are before approving this product.

Waste and Energy

Solid waste management is important to California. Construction waste and demolition debris are a major portion of the waste stream and much effort has been made to increase the proportion of construction materials that can be re-cycled and diverted from the landfill.

Copper piping is eminently recyclable. There is no recycle market for PEX due to the effect of crosslinking. PPFA claims that PEX waste can be burned for fuel, but that is not acceptable as recycling in California. Mr. Messick cites potential energy savings, without citation. The energy cost of copper produced through recycling is favorable and copper is routinely recycled. The incremental benefit from lower heat conductivity for PEX compared with copper should be minimal if hot water pipes are insulated in accordance with current codes. Considering the concern for energy supply and the extent of California solid waste legislation and regulation, this subject deserves explicit consideration by HCD.

Conclusion

The recent additions to the file do not actually supply new information. The manufacturers and NSF could have done so, but they did not. Clearly, the present record lacks sufficient information to allow the state to dismiss the potential for environmental impact. HCD should gather the necessary information in accordance with CEQA to determine whether or not the impact potential would be realized. Ironically, if industry had cooperated and supplied relevant manufacturing data and third party test results, the process could have been completed by now.

Sincerely,

Thomas S. Reid